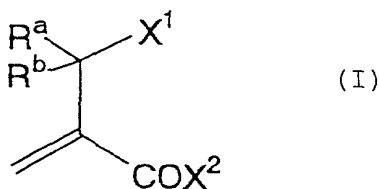


WHAT IS CLAIMED IS:

1. A lithographic printing plate precursor comprising a hydrophilic support having provided thereon an image-forming layer containing a radical initiator, an infrared absorbing dye, and at least one component selected from fine particles containing a radical polymerizable compound having a structure represented by formula (I) shown below and microcapsules encapsulating a radical polymerizable compound having a structure represented by formula (I) shown below.



wherein  $X^1$  and  $X^2$ , which may be the same or different, each represents a halogen atom or a group connected through a hetero atom;  $R^a$  and  $R^b$ , which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group or an organic residue; or  $X^1$  and  $X^2$ ,  $R^a$  and  $R^b$ , or  $X^1$  and  $R^a$  or  $R^b$  may combine with each other to form a cyclic structure.

2. The lithographic printing plate precursor as claimed in Claim 1, wherein  $X^1$  represents a halogen atom, a hydroxy group, a substituted oxy group, a mercapto group, a substituted thio group, an amino group, a substituted amino group, a sulfo group, a sulfonato group, a substituted sulfinyl

group, a substituted sulfonyl group, a phosphono group, a substituted phosphono group, a phosphonato group, a substituted phosphonato group, a nitro group or a heterocyclic group that is connected through a hetero atom included therein.

3. The lithographic printing plate precursor as claimed in Claim 1, wherein  $X^2$  represents a halogen atom, a hydroxy group, a substituted oxy group, a mercapto group, a substituted thio group, an amino group, a substituted amino group or a heterocyclic group that is connected through a hetero atom included therein.

4. The lithographic printing plate precursor as claimed in Claim 1, wherein  $R^a$  and  $R^b$ , which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group which may have a substituent and/or an unsaturated bond, a substituted oxy group, a substituted thio group, a substituted amino group, a substituted carbonyl group or a carboxylato group.

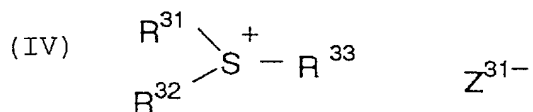
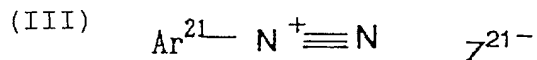
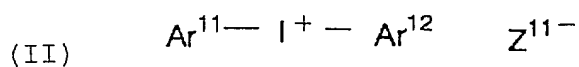
5. The lithographic printing plate precursor as claimed in Claim 1, wherein the radical polymerizable compound has at least two structures represented by formula (I).

6. The lithographic printing plate precursor as claimed in Claim 1, wherein the radical polymerizable compound is a polymer having the structure represented by formula (I) in the side chain thereof.

7. The lithographic printing plate precursor as claimed in Claim 1, wherein the radical initiator is selected from (a) an aromatic ketone, (b) an aromatic onium salt compound, (c) an organic peroxide, (d) a thio compound, (e) a hexaarylbiimidazole compound, (f) a ketoxime ester compound, (g) a borate compound, (h) an azinium compound, (i) a metallocene compound, (j) an active ester compound, and (k) a compound having a carbon-halogen bond.

8. The lithographic printing plate precursor as claimed in Claim 1, wherein the radical initiator is an onium salt selected from a diazonium salt, an iodonium salt, a sulfonium salt, an ammonium salt and a pyridinium salt.

9. The lithographic printing plate precursor as claimed in Claim 8, wherein the onium salt is a compound represented by the following formulae (II) to (IV):



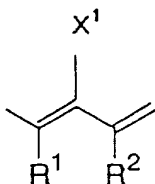
wherein  $Ar^{11}$  and  $Ar^{12}$  each independently represents an aryl group having not more than 20 carbon atoms, which may have a

substituent;  $Z^{11-}$  represents a counter ion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, hexafluorophosphate ion and a sulfonate ion;  $Ar^{21}$  represents an aryl group having not more than 20 carbon atoms, which may have a substituent;  $Z^{21-}$  represents a counter ion having the same meaning as defined for  $Z^{11-}$ ;  $R^{31}$ ,  $R^{32}$  and  $R^{33}$ , which may be the same or different, each represents a hydrocarbon group having not more than 20 carbon atoms, which may have a substituent; and  $Z^{31-}$  represents a counter ion having the same meaning as defined for  $Z^{11-}$ .

10. The lithographic printing plate precursor as claimed in Claim 1, wherein the infrared absorbing dye is an anionic infrared absorbing dye, a cationic infrared absorbing dye or a nonionic infrared absorbing dye.

11. The lithographic printing plate precursor as claimed in Claim 1, wherein the infrared absorbing dye is a polymethine dye.

12. The lithographic printing plate precursor as claimed in Claim 1, wherein the infrared absorbing dye is a cyanine dye having the partial structure represented by the following formula (2):

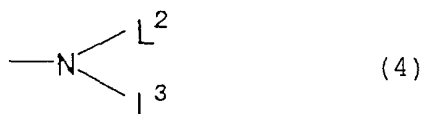


(2)

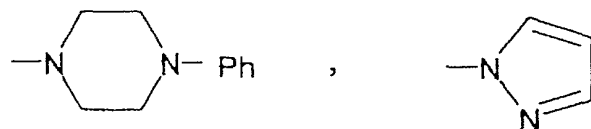
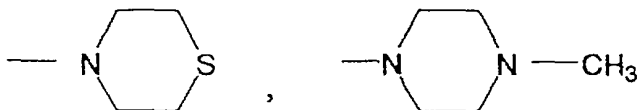
wherein,  $R^1$  and  $R^2$  each independently represents a hydrogen atom or a hydrocarbon group having from 1 to 12 carbon atoms, or  $R^1$  and  $R^2$  may combine with each other to form a ring structure; and  $X^1$  represents a halogen atom or a substituent represented by the following formula (3), (4), (5) or (6):



wherein  $X^2$  represents an oxygen atom or a sulfur atom; and  $L^1$  represents a hydrocarbon group having from 1 to 12 carbon atoms;

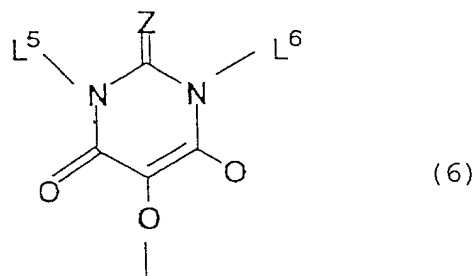


wherein  $L^2$  and  $L^3$ , which may be the same or different, each represents an aromatic hydrocarbon group having from 6 to 10 carbon atoms, which may have a substituent, an alkyl group having from 1 to 8 carbon atoms, which may have a substituent, or a hydrogen atom, or  $L^2$  and  $L^3$  may combine with each other to form a ring having the following structure;



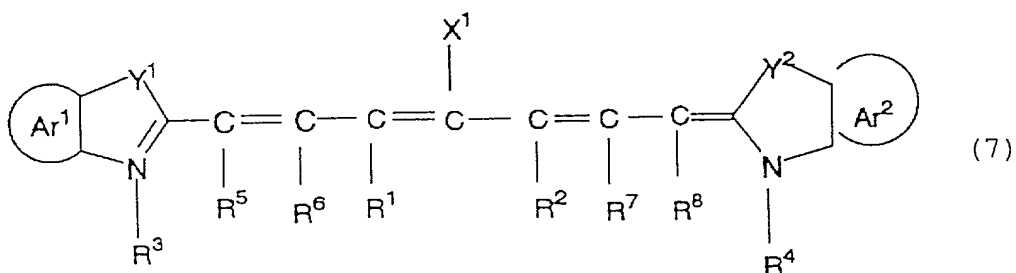


wherein  $L^4$  represents a monocyclic or polycyclic heterocyclic group having at least one of a nitrogen atom, an oxygen atom and a sulfur atom;



wherein  $L^5$  and  $L^6$ , which may be the same or different, each represents a hydrogen atom, an allyl group, a cyclohexyl group or an alkyl group having from 1 to 8 carbon atoms; and  $Z$  represents an oxygen atom or a sulfur atom.

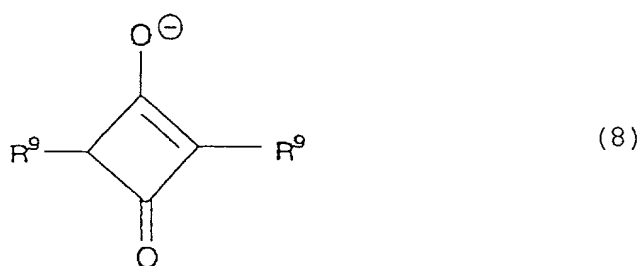
13. The lithographic printing plate precursor as claimed in Claim 12, wherein the cyanine dye is a heptamethinecyanine dye represented by formula (7) shown below having an indolenine skeleton, a benzindolenine skeleton, a benzothiazole skeleton, a benzoxazole skeleton or a benzoselenazole skeleton:



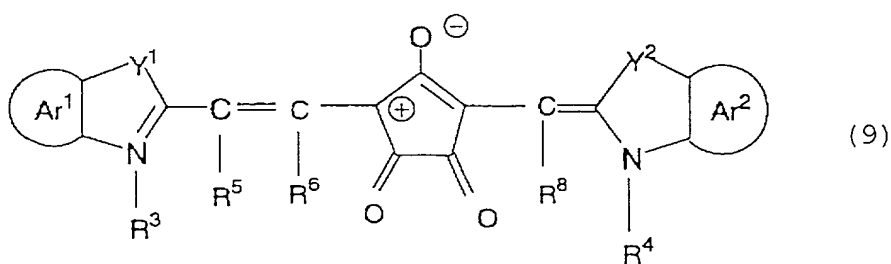
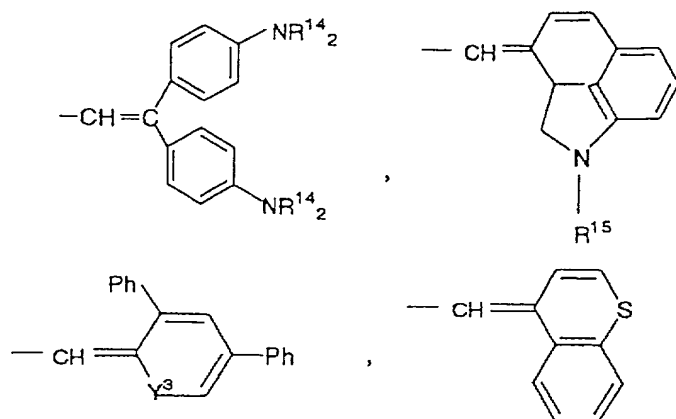
wherein  $X^1$ ,  $R^1$  and  $R^2$  have the same meanings as defined in formula (2) in Claim 12;  $Ar^1$  and  $Ar^2$ , which may be the same or different,

each represents an aromatic hydrocarbon group which may has a substituent;  $Y^1$  and  $Y^2$ , which may be the same or different, each represents an oxygen atom, a sulfur atom, a selenium atom or a dialkylmethylene group having not more than 12 carbon atoms;  $R^3$  and  $R^4$ , which may be the same or different, each represents a hydrocarbon group having not more than 20 carbon atoms, which may has a substituent;  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$ , which may be the same or different, each represents a hydrogen atom or a hydrocarbon group having not more than 12 carbon atoms; and  $Z^{1-}$  represents a counter anion provided that, when one of  $R^1$  to  $R^8$  is substituted with a sulfo group,  $Z^{1-}$  is unnecessary.

14. The lithographic printing plate precursor as claimed in Claim 12, wherein the cyanine dye is a dye represented by the following formula (8) or (9):



wherein  $R^9$  represents a substituent selected from the groups shown below, wherein  $R^{14}$  and  $R^{15}$  each represents an alkyl group having from 1 to 8 carbon atoms; and  $Y^3$  represents an oxygen atom or a sulfur atom;



wherein  $R^3$  and  $R^4$ , which may be the same or different, each represents a hydrocarbon group having not more than 20 carbon atoms, which may has a substituent;  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$ , which may be the same or different, each represents a hydrogen atom or a hydrocarbon group having not more than 12 carbon atoms;  $Ar^1$  and  $Ar^2$ , which may be the same or different, each represents an aromatic hydrocarbon group which may has a substituent; and  $Y^1$  and  $Y^2$ , which may be the same or different, each represents an



oxygen atom, a sulfur atom, a selenium atom or a dialkylmethylene group having not more than 12 carbon atoms.

15. The lithographic printing plate precursor as claimed in Claim 1, wherein the fine particles containing a radical polymerizable compound having a structure represented by formula (I) or the microcapsules encapsulating a radical polymerizable compound having a structure represented by formula (I) contains at least one of the radical initiator and infrared absorbing dye.

16. The lithographic printing plate precursor as claimed in Claim 1, wherein the image-forming layer further contains a hydrophilic resin.

17. The lithographic printing plate precursor as claimed in Claim 1, which further comprises an overcoat layer provided on the image-forming layer.